Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V DRAFT PERMIT NO. V-04-004
EBONITE INTERNATIONAL, INCORPORATED
HOPKINSVILLE, KY.
DECEMBER 24, 2003
CHRIS LESLIE, REVIEWER
PLANT I.D. #21-047-00054
APPLICATION LOG #50734

SOURCE DESCRIPTION:

This source manufactures bowling balls composed of a polymeric blend of materials. Two basic types of bowling balls are produced, a polyester bowling ball and a polyurethane bowling ball. Each of these two types of balls are produced with a range of different weights from 7 pounds to 15 pounds and a range of different colors. The different weights of the balls are controlled by inert solid ingredients and also by the type of core used. The core is the starting point for the manufacturing process and four different types of cores are produced, a small polyester core, a large polyester core, a large two-part polyester core, and a polyurethane foam core. The raw materials for the polyester cores consist of polyester resin, styrene, and dry fillers (calcium carbonate, baryte, extendosphere). The polyester resin and styrene are stored in eight storage tanks outside the facility and two tanks inside the facility and the dry fillers are kept in hoppers inside the facility. The raw materials are piped to mixing tanks in the polyester core area, small core area and large core area, the solution is then mixed with MEK peroxide, to catalyze the polymerization, and poured into the core molds and allowed to cure on curing lines until core solidification is complete. The large two part polyester cores are produced in the same way except that a small polyester core is added to the mold prior to the addition of polyester resin and styrene. The raw materials for the polyurethane foam core consist of MDI (4,4'- methylene diphenyl diisocyanate) and polyol. The MDI is stored in three storage tanks inside the facility and the polyol is stored in two tanks inside the facility. The raw materials are pumped to a mixing tank in the polyurethane core area, mixed with MEK peroxide, poured into the mold and allowed to cure and then sent to one of three curing ovens for additional curing.

Once the polyester and polyurethane cores have cured they are taken to an area of the facility to be deknobbed, drilled, and ground. Equipment used includes lathes and drills. A baghouse with 99% control efficiency is used to control particulate emissions in this area. The completed cores are then taken to either the polyester veneer area or the polyurethane veneer area.

In the polyester veneer area there are four tanks that can be used for mixing the polyester resin and styrene and each tank has a different colorant added to it. This is done to create different colors in the bowling balls. Once certain criteria are met for the mixture, the material is sent to be poured into a mold with a core inside of it. Just before the mix goes into the mold, MEK peroxide is added to catalyze the polymerization. The filled mold is then placed on a rack on the curing line for at least five hours before it is demolded and deknobbed. The ball is then sent to be ground and buffed in the ball grinding and buffing area. The system can produce up to 1200 balls per eight hour shift. The system is flushed with DBE (dibasic ester) at the end of the shift.

In the polyurethane ball area polyol and MDI are stored in separate holding tanks in the veneer mixing area. The two chemicals are mixed at the pour head as each individual mold is filled on the cure line. The balls are then place on another line and sent to the curing oven. Once the balls have gone through the oven, they are demolded and deknobbed. The balls are then sent to be ground and buffed in the ball grinding and buffing area. Once the balls have been buffed, they go through the finish line and are sent to storage. It should be noted that there are two polyurethane ball areas. One area is referred to as the polyurethane area and the other is referred to as the annex or urethane balls system 4. The molding equipment is washed with methylene chloride in cold metal degreasers or separately.

The completed bowling balls are then packaged and stored awaiting shipment.

COMMENTS:

The particulate emissions are controlled by a baghouse. The MDI emissions are so low that they are considered insignificant so therefore there is no control equipment associated with the MDI emissions. The styrene and methylene chloride emissions also do not have any control equipment associated with them and are therefore fugitive HAP emissions.

Emissions associated with all the storage tanks were calculated using EPA's TANKS 4.0 modeling program. The combustion emissions associated with the natural gas burners of the ovens were calculated using AP-42 emission factors. All other process emissions were taken from calculations submitted by the facility's consultant. The results of the analysis are summarized in the poc table. Since this review has disclosed that all requirements will be met, a preliminary determination proposes that a draft permit may be issued as conditioned, but contingent to the satisfactory resolution of any adverse public comments which might be received.

Based on the information provided, the Division concludes that Regulation 401 KAR 63:020 apply to the styrene processing units. And Regulations 401 KAR 63:021 and 401 KAR 63:020 apply to the MDI, and equipment cleaning (methylene chloride) processing units. Regulations 401 KAR 59:185, New solvent metal cleaning equipment and 401 KAR 63:002, National emissions standards for hazardous air pollutants, which incorporates by reference 40 CFR 63 Subpart T, National Emission Standards for Halogenated Solvent Cleaning, apply to the methylene chloride cold metal degreasers. Regulation 401 KAR 59:010 apply to the drilling, grinding, and buffing equipment and combustion units.

Computer-based air emissions modeling was performed using the ISCST3 program to ensure that ambient concentrations of styrene and methylene chloride, at and beyond the plant boundary, do not exceed the Preliminary Remediation Goals (PRG's) as established by USEPA Region 9. For styrene a maximum value of 3.16 micrograms/cubic meter was determined, which is below the PRG for styrene of 1100 micrograms/cubic meter. For methylene chloride a maximum value of 2.18 micrograms/cubic meter was determined, which is below the PRG for methylene chloride of 4.1 micrograms/cubic meter.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.